Finding The ISO Speed of Photographic Print Paper

(*For the use of Making Paper Negatives in a camera+)*

What is the ISO ("speed") of any photographic print paper? – When we choose to make use of it for the making of a Paper Negative - the ISO will be the "Constant" for calculating the exposure. The information on the "data sheet" that comes with the box of paper is NOT what we would use when we are trying to use Paper as a recording medium. We must find this out Before we made our calculations of exposure and then proceed to make use of it — The ISO is the "Constant" for the calculations - and the Aperture and Shutter Speeds are the Variables for the proper setting of any exposure. The constant should Not Very.

To do this, we must test each of the different papers we are about to use. Different manufactures and different paper, I have found, vary somewhat of the speed of the ISO. AND even the Expiration Dates of some must be taken into the equation as well, as in time some photo-paper will lose their effectiveness as there sensitivity. (*Some will degrade to the point of not being usable at all, due to storage and handling of the product*.)

Let us say that we have purchased a fresh up to date SEALED box of Photo Paper. There is usually a "Fact-Sheet" of information about the chemical developer to be used. Any chemical developer that is formulated for the development of paper will work. However - only You, the experimenter, can be the judge on what You want your "look" to be. So – Experimentation is a MUST. And First and foremost, we MUST find a good ISO speed of the paper we have chosen.

From a box of 8X10 Photo Paper, cut and load Twelve (12) film holders. (4X5 Will work best for this testing.) Prepare your NOTEBOOK to begin the testing. Mix your chemicals (i.e.= Developer, Stop, and Fixer). I use a 1:4 ratio on my developer of Ansco-120. (*I shall give the Formula for this at the last page of this article*.)

GET A "SPOT-METER"..... (Overall ambient light meters, and the "apps" on your phone will not give you precise readings.) Most Spot-Meters will read a 3 Degree area of selection. (The meter I use is a "Pentax Spotmatic-5", and will read 1 Degree.)

(**NOTE** >> I have posted the "Pentax Spotmatic-5" instructions in the "Files" Section of our F-B Page.)

FIRST set the ISO on Three (3) and take a reading of a Zone 5 area in your backyard or ANY area that is comparable, on a sunny day. (Zone 5 is also 18% Gray - to people that are digital shooters). Anywhat!!.... After you read the EV number, look on the scale of the meter to see what f-Stop and Shutter Speed would make the best image. Now... Set the lens to these readings. Remove the dark slide and make the exposure. Label this ONE - and Write in your notes these settings for that exposure.

Next - Without moving the exposure settings (f-Stop and Shutter), Move the ISO from 3 to 6.... The f-Stop and Shutter readings have changed. Make the Second Exposure of the f-Stop and Shutter Speed indicated. This will be Number 2 - write this down in your notes. Continue making exposures after moving the ISO to higher numbers till you are out of "Test Negatives", up to 12. (*You do not have to take more readings = Unless the LIGHT has changed. Just move the ISO dial to the next ISO number.*) After this it is into the darkroom and develop the test images.

I advise to use a timer to keep the time of development at the SAME development time for each of the 12 test negatives you have produced. You want to be critical about this. Not "Willie-Nilly". The best developments will come by keeping notes. The time of full development might be somewhere between 45 seconds and 1 minute and 30 seconds. The way I know that the developer is correct in it's ratio is to see if the negative image begins at 15 to 20 seconds. If the negative starts to come-up at 5 to 10 seconds of development - the developer is Way Too Strong. Dilute accordingly so you see the image begin at 15 to 20 seconds. This will assure that there will be little or NO "Chemical Fogging".... (*Chemical fogging is caused by too strong of a mix of developer and you WILL have streaks and uneven development. Unless that is what you desire to have in your work... As for me - NO!!! I do Not like that particular look.... Especially in the testing of the photo papers that I use.*)

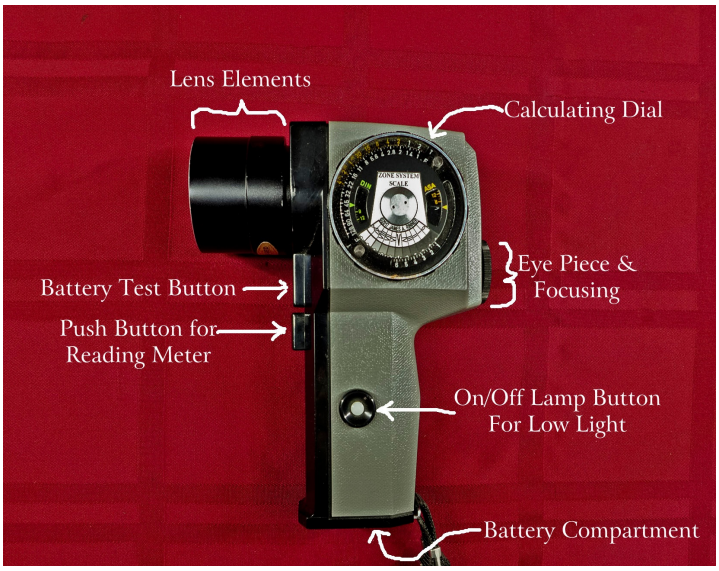
When all 12 of the test negatives are developed and fixed - dry the negatives and compare as to what YOU want this particular paper's ISO. WRITE THAT ISO ON THE BOX of Paper to use as a reference at a later time, and the developer and ratio used. You can always know "what" is what with this box of paper to use later on and get good accurate constant results.

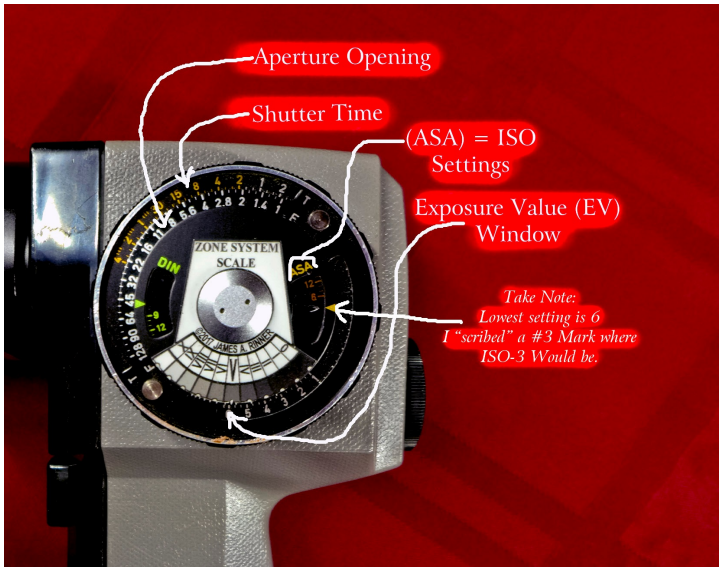
On the next pages == Here are Photo Illustrations as to what I did, and do, to test each make and grade of the paper I use in the making of Paper Negatives to print later and display.

REMEMBER to Keep a NOTEBOOK on what You are DOING. If not = you are just pissing in the wind.

Thank you for reading this article.

James R. Kyle, Photographer - Saint Louis, Missouri, U.S.A.





(Shown above is the Pentax Spotmatic-5 meter that I make use of for my Paper Negative exposures.)

NOTES On ISO Test

This test showed that - for my work flow with the camera settings of f-Stops, and Shutter Speeds - The best for "Multi-Grade" papers, would be the selection of ISO Three (3) to about as high as Eight (8) = depending on the Light Given while capturing images in natural light (outdoor light).

In this test, I made a choice to leave the f-Stop at that of Eleven (f-11) and would vary the Shutter Speed in accordance with the readings of my Spot-Meter, of the average light of the area.

ARISTA RC Single Weight Paper -- ISO - Spread Test / Camera Used = Toyo 4X5, Tripod Mounted. Rodenstock 150mm 5.6 Lens.

Medium Overcast Light – F-Stop = f-11 in ALL ten Test Images.

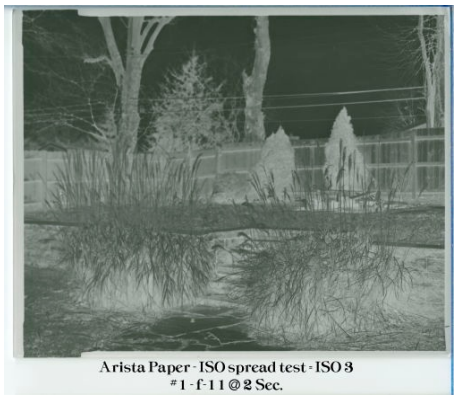
Image Number	ISO	Shutter Speed
1 -	3	2-Seconds
2 -	8	1.5- "
3 -	12	1/2 "
4 -	20	1/5th "
5 -	50	1/8th "
6 -	75	1/10th "
7 -	100	1/15th "
8 -	150	1/20th "
9 -	200	1/30th "
10 -	400	1/60th "

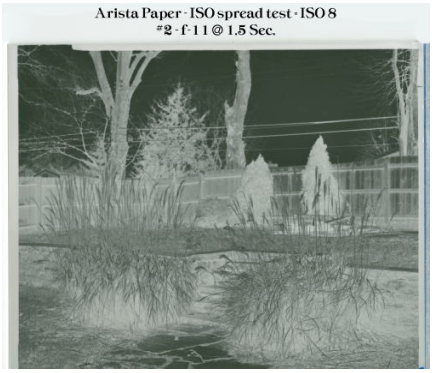
Development NOTES –

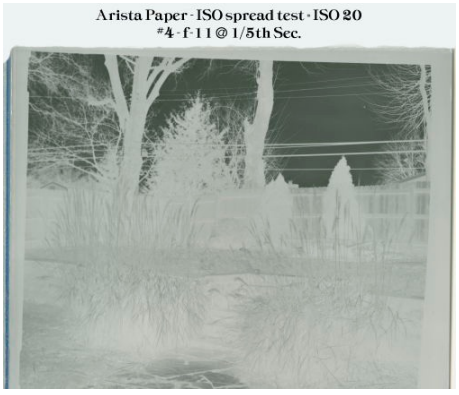
ETHOL(LPD) + DEKTOL Mix... Ethol @ 1:8 (From stock of 1:1) in 12 Oz. Water // Dektol @ 1:4 in 12 Oz. Water (From stock of 1:1) = Added 8 Oz. Water to top off at 32 Oz. (*Dev Time will vary with use.*) Regular standard Stop for 15 seconds -- and standard Fixer for 15 Minutes.

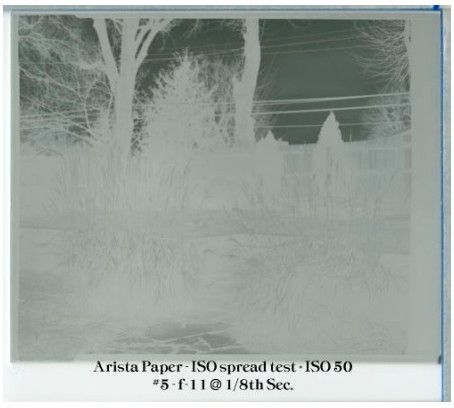
Image Number	Time in Dev.	NOTED Change
1 -	1 - Min	Usual Well Developed
2 -	1 - Min	Very light loss of some tones - Usable.
3 -	1 - Min	A little more loss of tones - Usable but must edit.
4 -	1 - Min	" " " " - Very difficult to edit.
5 -	1.5 - Min	Noticeable loss of tones - Would not make good print.
6 -	1.5 - Min	" " " " " " "
7 -	1.5 - Min	Very " " " " " " "
8 -	Ect	Ect --
9 -	Ect	Ect --
10 -	Ect	Ect --

End of Test









Ansco 120/JK - Soft Paper Developer -
(This formula has been readjusted by James R. Kyle)

Water (distilled) = 700 = ML (@110 F.)
Add - in order of list- 1 through 4

1) Metol = 12 Grams
2) Sodium Sulfite = 36 G.
3) Sodium Carbonate = 34 G.
4) Potassium Bromide = 2 G.

- Devolve Each Separately as shown -
Add enough water to bring the mix to One Later.

(This IS the "Stock Solution")
The stock solution will last about 4 to 8 months - Store in a dark bottle in cool place.

Working solution should be:
1:4 or 1:6

(Discard after solution becomes a brownish color or when development is over 2 minutes.)

Use Working Solution @ 68 F. (20 C.) or a little lower.

((This formula is in the "Darkroom Cookbook" by Steve Anchell – 3rd Ed. page 248)
Every Experimenting Photographer Should Have A Copy of This Book))

Thank You for reading
James R. Kyle, Photographer - Saint Louis, Missouri